

LIST OF REFERENCES CITED
BY APPLICANT
(Use several sheets if necessary)

Atty Docket No.: 71257
 Ser. No.: 10/748.608
 Confirm. No.: 8657
 Applicant: BONDIOLI
 Filing Date: December 30, 2003
 Group: 3679



U.S. PATENT DOCUMENTS

Ex-aminer Initial Document No. Date Name Class class Sub-Filing Date

	<u>6.719.636 B2</u>	<u>April 13, 2004</u>	<u>Herchenbach et al.</u>			<u>April 25, 2002</u>
	<u>2002/0187840 A1</u>	<u>Dec. 12, 2002</u>	<u>Herchenbach et al.</u>			<u>April 25, 2002</u>
	<u>4.799.817</u>	<u>Jan. 24, 1989</u>	<u>Geisthoff</u>			<u>Oct. 14, 1987</u>
	<u>4.490.125</u>	<u>Dec. 25, 1984</u>	<u>Konrad et al.</u>			<u>Sept. 23, 1982</u>

FOREIGN PATENT DOCUMENTS

Ex-aminer Initial Document No. Date Country Class class Sub-Translation Yes/No

	<u>EP 1 253 338 A1</u>	<u>Oct. 30, 2002</u>	<u>Europe</u>			<u>No</u>
	<u>GB 894.806</u>	<u>April 26, 1962</u>	<u>United Kingdom</u>			<u>Yes</u>

OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

Ex-aminer Initial Author Date Title Textbook in Translation Yes/No

7/29/2005 EDANTZLE 00000001 10748608

FC:1806 180.00 DA
71257

Date Considered

Adjustment date: 09/29/2005 SDIRETA1
 06/29/2005 EDANTZLE 00000001 130410 10748608
 01 FC:1806 180.00 CR



7-29-05

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ATTORNEY DOCKET NO: 71257

PATENT MAINTENANCE
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2005 AUG -4 PM 3:10

US PATENT & TRADEMARK
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Applicant : BONDOLI
Serial No. : 10/748,608
Confirm. No. : 8657
Filed : December 30, 2003
For : WIDE-ANGLE ...
Dated : July 28, 2005

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
ATTENTION: Office of Finance - Refund Section

REQUEST FOR REFUND

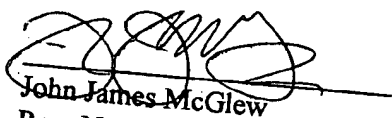
Sir:

Applicant's attorney's deposit account no. 13-0410 has been charged \$180.00 under fee code 1806 in error. On June 1, 2005 Applicant filed an Amendment enclosing a European Search Report dated April 12, 2005 and references cited therein. A copy of the Amendment and the European Search Report are enclosed. Applicant's attorney noted in the Amendment that the European Search Report issued less than three months prior to the filing of the Amendment.

Therefore, a refund of \$180.00 is respectfully requested to be credited to deposit account number 13-0410.

Respectfully submitted
for Applicant,

By:


John James McGlew

Reg. No.: 31,903

For: MCGLEW AND TUTTLE, P.C.



JJM:tf
71257.8

Enclosed:

Monthly Statement of Deposit Account
copy of Amendment filed June 1, 2005
copy of European Search Report dated April 12, 2005

DATED:

July 28, 2005
SCARBOROUGH STATION
SCARBOROUGH, NEW YORK 10510-0827
(914) 941-5600

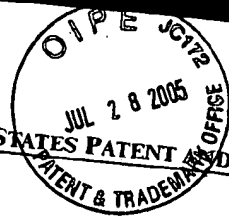
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By: Jonathan Forte

Date: July 28, 2005



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6	23	05	1	10109476	60 71058	9203	-2000.00	7037.95
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6	29	05	15	10524321	60 71696	2251	60.00	6547.95
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6	29	05	3	10318119	71257	2641	-50.00	6597.95
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6	7	05	3	10827758				
6	8	05	3	10520751				
6	8	05	69	11113892				
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Département à
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Division de la
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Zeichen/Ref./Réf.

47252

Datum/Date

21.04.05

Anmelder/Applicant/Demandeur/Patentinhaber/Propriétaire/Titulaire
Bondioli, Edi

Anmeldung Nr./Application No./Demande n°/Patent Nr./Patent No./Brevet n°.
04425001.7-1252-

COMMUNICATION

The European Patent Office herewith transmits as an enclosure the European search report for the above-mentioned European patent application.

If applicable, copies of the documents cited in the European search report are attached.

☐ Additional set(s) of copies of the documents cited in the European search report is (are) enclosed as well.

The following specifications given by the applicant have been approved by the Search Division:

☒ abstract

☐ title

☐ The abstract was modified by the Search Division and the definitive text is attached to this communication.

The following figure will be published together with the abstract: 2

21/10/05/m

REFUND OF THE SEARCH FEE

If applicable under Article 10 Rules relating to fees, a separate communication from the Receiving Section on the refund of the search fee will be sent later.





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 42 5001

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 1 253 338 A (GKN WALTERSCHEID GMBH) 30 October 2002 (2002-10-30) * abstract * * figures *	1	F16D3/32
A	US 4 799 817 A (GEISTHOFF ET AL) 24 January 1989 (1989-01-24) * column 4, line 14 - line 45 * * figures *	1	
A	GB 894 806 A (FORD MOTOR COMPANY LIMITED) 26 April 1962 (1962-04-26) * page 4, line 49 - line 58 * * figures *	1	
A	US 4 490 125 A (KONRAD ET AL) 25 December 1984 (1984-12-25) * column 3, line 25 - line 39 * * figures *	1	

TECHNICAL FIELDS
SEARCHED (Int.Cl.7)

F16D

The present search report has been drawn up for all claims

Place of search

The Hague

Date of completion of the search

12 April 2005

Examiner

Vermander, W

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.

EP 04 42 5001

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

12-04-2005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1253338	A	30-10-2002	DE 10120432 A1	14-11-2002
			AU 755323 B2	12-12-2002
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			FR 2513712 A1	01-04-1983
			IT 1157562 B	18-02-1987
			JP 58057517 A	05-04-1983



ATTORNEY DOCKET NO: 71257

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : BONDOLI
Serial No : 10/748,608
Confirm. No : 8657
Filed : December 30, 2003
For : WIDE-ANGLE ...
Art Unit : 3679
Examiner : Gregory John BINDA
Dated : June 1, 2005

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT

In response to the Office Action dated March 1, 2005, please amend the above-identified application as follows:

IN THE DRAWINGS:

Attached are the replacement drawings.

IN THE SPECIFICATION:

Please replace the specification originally filed, with the enclosed substitute specification. A marked up copy of the original specification is attached. Applicant states that no new matter has been added.

IN THE CLAIMS:

1 - 2 (Canceled)

3. (New) A wide-angle constant-velocity joint comprising:
two forks forming input and output members of the joint, the forks having respective
spherical end heads;

two spiders;

a central core forming a housing;

one basically discoidal constraint member forming seats for the spherical end heads of
said two forks, said housing receiving said constraint member for sliding movement in a
transverse plane of symmetry of the central core, said constraint member moving when in use
in the transverse plane, said housing having two surfaces disposed parallel to the transverse
plane;

a laminar ring interposed between one of said two surfaces and an opposing face of said
constraint member resulting in continuous annular contact with said one of said two surfaces;
and

another laminar ring interposed between another one of said two surfaces and another
opposing face of said constraint member resulting in continuous annular contact with said
another one of said two surfaces and with said opposing face of the constraint member, wherein
at least one of said laminar ring and said another laminar ring is formed of an elastic material
and is shaped as a Belleville washer which bears via an outer edge on one of said two surfaces

and via an inner edge against the opposing face of said constraint member.

4. (New) A constant-velocity joint according to claim 3, wherein both of said laminar rings are of an elastic material and shaped as Belleville washers.

5. (New) A wide-angle constant-velocity joint comprising:
a first fork forming an input or output member of the joint, said first fork having a first fork spherical end head;

a second fork forming an input or output member of the joint, said second fork having a second fork spherical end head;

a central core forming a housing;

a first spider pivotally connected to said first fork and to said housing;

a second spider pivotally connected to said first fork and to said housing;

a discoidal constraint member having a first seat receiving said first fork spherical end head and having a second seat receiving said second fork spherical end head, said housing

supporting said constraint member for sliding movement in a transverse plane of symmetry of the central core, said constraint member moving when in use in the transverse plane;

said housing having a first surface and a second surface disposed parallel to the transverse plane;

a first laminar ring interposed between said first surface and an opposing first face of said constraint member resulting in continuous annular contact with said first surface; and

a second laminar ring interposed between said second surface and an opposing second

face of said constraint member resulting in continuous annular contact with said second surface and with said opposing second face of the constraint member, wherein said first laminar ring is formed of an elastic material diaphragm spring washer having an outer edge bearing against said first surface and having an inner edge bearing against said opposing first face of said constraint member to form a sealing barrier to retain lubricant in said housing and restrict lubricant from passing from said housing beyond said first surface.

20 6. (New) A constant-velocity joint according to claim 5, wherein said first laminar ring is shaped as Belleville washers.

7. (New) A constant-velocity joint according to claim 6, wherein said second laminar ring is formed of an elastic material and is shaped as a Belleville washer.

8. (New) A wide-angle constant-velocity joint comprising:
a first fork forming an input or output member of the joint, said first fork having a first fork spherical end head;
a second fork forming an input or output member of the joint, said second fork having a second fork spherical end head;
a central core forming a housing;
a first spider pivotally connected to said first fork and to said housing;
a second spider pivotally connected to said first fork and to said housing;

10 a discoidal constraint member having a first seat receiving said first fork spherical end head and having a second seat receiving said second fork spherical end head, said housing supporting said constraint member for sliding movement in a transverse plane of symmetry of the central core, said constraint member moving when in use in the transverse plane, said housing having a first surface and a second surface disposed parallel to the transverse plane;

15 a first laminar ring interposed between said first surface and an opposing first face of said constraint member resulting in continuous annular contact with said first surface, said first laminar ring having an opening through which said first seat extends, said first laminar ring being floatingly mounted in said housing to move within said housing upon movement of said first seat; and

20 a second laminar ring interposed between said second surface and an opposing second face of said constraint member resulting in continuous annular contact with said second surface and with said opposing second face of the constraint member, said second laminar ring being floatingly mounted in said housing to move within said housing upon movement of said second seat, wherein said first laminar ring is formed of an elastic material diaphragm spring washer having an outer edge constantly bearing against said first surface during movement of said first laminar ring and having an inner edge constantly bearing against said opposing first face of said constraint member during movement of said first laminar ring to form a sealing barrier to retain lubricant in said housing and restrict lubricant from passing from said housing beyond said first surface.

9. (New) A constant-velocity joint according to claim 8, wherein said second laminar ring is formed of an elastic material diaphragm spring washer having an outer edge constantly bearing against said second surface during movement of said second laminar ring and having an inner edge constantly bearing against said opposing second face of said constraint member during movement of said second laminar ring to form a sealing barrier to retain lubricant in said housing and restrict lubricant from passing from said housing beyond said second surface.

10. (New) A constant-velocity joint according to claim 9, wherein said first laminar ring and said second laminar ring are shaped as a Belleville washer.

REMARKS

Claims 3 - 10 are in this application and are presented for consideration. By this Amendment, Applicant has canceled original claims 1 and 2 in favor of the new claims. New claim 3 is similar to original claim 1 but has been represented in the U.S. style and paying close attention to the objections and rejections based on form. New claim 4 is similar to claim 2. New claim 5 is similar to claim 1 but highlights each individual element in particular and defines the sealing barrier structure based on the diaphragm spring washer with edges bearing against the surface of the housing and face of the constraint member as claimed. Claims 6 and 7 are similar to original claim 2. New claim 8 is similar to claim 5 and further highlights the floating mount of the laminar rings.

Priority:

The correct priority number is FI2003A000001. Applicant's representative notes that the photocopy of the first page of the certified copy clearly indicates this. It is noted that the Examiner may be viewing a poorly scanned version of the original. The front page of the EP published application EP 1435466 is wrong due to a mistake by the EPO. No further comment should be needed. However, it is noted that the priority number was properly indicated in the application form filed with the EPO. A copy of the filing document of the EP application is enclosed as an evidence. It can be noted The Examiner can see the filed documents on the epoline server (<http://ofi.epoline.org/view/GetDossier>) where the whole electronic file is available for inspection. The filing date is clearly shown in the certified copy of the priority

document. The certified copy of the priority document includes a copy of the filing receipt, where the filing date is typed. Enclosed herewith is a further copy of the filing receipt where the filing date is highlighted. The filing date is written in letters rather than numbers and is of course in Italian. The date January 2, 2003 which the examiner has noted in the priority document is the date on which the filing papers were prepared. The filing papers are usually prepared the day before filing. The Italian PTO requires this (useless) data to be included in the filing papers. However this is not the filing date. In conclusion: the priority date is January 3, 2003 and the priority number is FI2003A000001. Priority has been perfected.

Drawings

Applicant has submitted replacement sheets. In these, reference number 7 has been deleted.

Specification

The title has been changed. The applicant has adopted the title as published in the EP application, i.e. "Wide-angle constant velocity joint". Section headings have been included. Reference number 40C on page 3, last line has been changed to 40A as correctly indicated by the examiner. No new matter has been added.

Claim Objection

The newly presented claims present elements separated by a line indentation as noted

in 37 CFR 1.75(i). However, it must be kept in mind that there is no such requirement for indentation. Rule 1.75(i) is a suggestion and presents no requirement.

Claim Rejections - 35 USC § 112

The original claims have been rejected as being indefinite. Applicant has carefully considered these comments with regard to presenting the new claims. It is Applicant's position that the new claims are clear, definite and fully conform with the requirements of the statute.

Claim Rejections under 35 USC §103

The claims have been rejected as being unpatentable over US 5,419,740 – Koyari et al. (the primary reference) in view of US 3,429,144 - McIntosh (the secondary reference). The rejection is based on the position that it would be obvious to use Belleville washers as taught be McIntosh in the device of Koyari et al. based on the use of washer structures in each device as centering means for a constraint member.

The rejection in essence is based on the position that it would have been obvious to replace the washers 106 and 108 of the primary reference with Belleville washers or springs as disclosed in the secondary reference, since both have the function of centering a mechanical member with respect to another mechanical member. However, this is not reasonable as each reference teach arrangements of different functional and dynamic relationships. There is at least a lack of a teaching reference noting the desirability and reasonableness of such a selection of one feature and shoving it into a much different construction.

Koyari et al. presents various embodiments with at least the embodiment of Fig. 10 employing what can be considered washer structures, namely washer type structures 116 and 110 (see Fig. 10). The embodiment of Fig. 7 presents leaf springs 106 and 108 but these are not washers. More importantly, these elements are not positioned as specified in the claim (with portions contacting the surface of the housing and face of the constraint member (see further discussion below).

The rejection is not supported by the teachings of the references. Further, the references fail to recognize the problem involved, particularly with the combination of features with a closed lubricant space as claimed. The problem underlying the invention is not to provide proper centering of the constraint member 20 into the seat 24, but rather (as clearly disclosed in the application) to increase sealing against leakage of grease from the seat 24 to the exterior of the joint.

Thus, starting from the primary reference the person skilled in the art would not have looked into the secondary reference to find a suggestion to solve any problem, and particularly not the problem involving sealing the lubricant space. Further, there is no recognition of a problem in either reference.

The Belleville spring of McIntosh is not arranged between mutually slidingly movable members between which sealing against grease leakage shall be provided. The way in which the Belleville springs are used in the claimed invention and the way of exploiting their elastic characteristics in the claimed invention is different from the use made in the secondary reference. As such, there is no suggestion the references to provide the combination of features

as claimed.

Additionally, the secondary reference does not at all face the problem of increasing the sealing against grease leakage. The washers 43 are arranged in a closed chamber where no leakage could occur. Thus, the skilled in the art would not have had any reason to combine the primary and the secondary reference together.

The ring 40 of the application may be considered the equivalent of rings 114, 116 of the primary reference. The claim clearly indicates that the rings 40 are arranged between each of the two surfaces 24A, 24B and the constraint member. The washers 106, 108 of the primary reference are not corresponding to members 40 and are not arranged as specified in the claims. Thus, even if these washers were replaced by the Belleville springs disclosed in the secondary reference, they would be mounted solid to the constraint member (20 in the application; 54 in the primary reference) and they would act against the rings 114, 116, which would remain flat. Moreover, even if the primary and the secondary references were combined, this combination would not result in the invention as claimed. Indeed, the claim requires that the outer edge of the Belleville spring rests on the surface 24A or 24B, while the inner edge of the Belleville spring rests on the opposing surface of the constraint member 20. Neither the secondary reference nor the primary reference would teach to the skilled in the art in which position to place the Belleville springs, so that one of the important features of the invention, which is needed to solve the problem underlying the invention, would not be derivable from the prior art.

As far as the Belleville spring is used to center a member as taught by the secondary reference, the orientation according to which said spring is mounted is irrelevant. The Belleville

springs disclosed in McIntosh do not have a central hole. Thus, they do not have an inner edge but only an outer edge. This is a further reason why the combination of the two references would not lead to the claimed invention.

The invention provides a joint that is not for centering the discoidal member, but rather to provide a very efficient lubricant retention (sealing) thus reducing lubricant consumption. The specification is very clear in stating which is the object of the invention. As stated on page 3, lines 19-24, if the rings 40 are flat as in conventional joints, their leakage prevention effect is very limited. Grease contained in the volume 24 is rapidly dispersed. This is due to several factors, among which the following shall be mentioned.

A limited pressure is exerted between the flat laminar rings 40, the walls 24A, 24B and the side walls of discoidal member 20. Leakage between two moving members is best prevented if a high pressure is exerted between the moving members. In order to generate a high pressure, a force must be applied which increases if the contact surface increases. In other words, if a pressure of say 100 N/cm^2 is required to obtain proper sealing, said pressure is achieved by applying a force equal to 100 N if the surface of contact is 1 cm^2 . However, if the surface of contact is 10 cm^2 , ten times the force (i.e. 1000 N) must be applied. Using a flat ring 40 results in a low pressure between the ring on the one side and the surfaces contacting the ring on the other (surface 24A, 24B; surfaces of discoidal member 20).

To increase this pressure too high a force would be necessary against the moving discoidal member 20, the motion of which would then be hindered.

A further factor which adversely effects the efficiency of flat rings is the thermal

expansion. Temperature causes expansion of the metal parts of the joint, which increases the clearance between the moving disc 20 and the flat rings 40, again reducing the sealing effect.

Also wear plays an important role since the movement of the disc 20 and of the flat laminar rings 40 causes wear and consequent increase of the clearance between moving members. This in turn results in poor sealing.

The invention is based on the idea of employing Belleville springs which are shaped and arranged as claimed, i.e. the outer edge of the Belleville spring bears against the surface 24A or 248 while the inner edge bears against the opposing face of the constraint member 20. The result of this special arrangement is that an increased pressure is generated along the two circumferential edges of the Belleville spring. A very high local pressure can be achieved just there where it is necessary to obtain efficient sealing against grease leakage. A relatively very low axial force is required to generate this high pressure.

In the design according to the invention a much lower force is required to achieve much higher local pressure values and thus more efficient leakage prevention.

Sealing efficiency is maintained even if the movable members are subject to wear, because the increased clearance is compensated by the deformation of the Belleville spring.

According to the invention, even substantial wear of the sliding surfaces does not lead to loss of sealing effect, because the Belleville spring simply tends to recover part of its elastic deformation thus compensating for the increased clearance. Even though the pressure along the contacting surface (the inner and the outer edges) is lowered, a substantial sealing effect is still retained. Similar beneficial effects are achieved in terms of compensating for thermal

dilations and consequent clearance increase.

Accordingly, Applicant respectfully requests that the Examiner reconsider the rejection in view of the new claims presented by this Amendment. The references as a whole fail to suggest the combination of features claimed. Neither the cited references suggests the particular contact edges contact a surface and a face as claimed. Further, there is a lack of a teaching reference suggesting the desirability of dropping the features of Koyari et al. and instead adopting the features of McIntosh. Of course such a combination of features would not present the combination as specified. Further, the change at best would be a starting point for which a person of ordinary skill would need to experiment in order to attain any useful structure. This is particularly apparent when considering the lack of McIntosh's teaching with regard to passages for seats and connections with fork elements as well as the particular deployment of spring elements in the embodiment of 7 of Koyari et al. wherein discrete spring portions are provided to achieve particular result.

EP Search Report - Information Disclosure Statement

Applicant requests that the Examiner consider references which have come to Applicant's attention based on a Search Report issued less than three months ago (the Search Report is dated April 21, 2005) wherein the references were not previously known to Applicant. EP 1 253 338 has been cited as technological background. Applicant attaches a copy of the European Search Report and asks the Examiner to consider the comments of that Search Report including any further statements as to relevancy. Applicant also attaches an English

language abstract and notes that U.S. 2002/187840 and U.S. 6,719,636 are indicated to be corresponding English language documents by the European Patent Office.


U.S. 4,799,817 is cited under Category A.

GB 894,806 has been cited under Category A.

U.S. 4,490,125 has been cited under Category A.

Consideration of the particulars of the European Search Report as well as the references noted above is requested.

Respectfully submitted
for Applicant,

By: 
John James McGlew
Registration No. 31,903
McGLEW AND TUTTLE, P.C.

JJM:jj/tf/JMS
71257.5

Enclosed:

- (4) Replacement Sheets of Drawings
- Substitute Specification
- Marked-Up Version of the Specification
- copy of Sheet from Priority Document
- copies of Sheets from European Patent Office
- PTO-1449 Form
- European Search Report
- copies of (6) References

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